NAEB

Engineering Newsletter

NATIONAL ASSOCIATION OF EDUCATIONAL BROADCASTERS

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TV TECHNICAL TIPS NO. 28

—By Cecil S. Bidlack, NAEB TV Engineer

Big news of the month, as far as the Engineering Service is concerned, is the publication of the report of the 1955 NAEB TV Engineering Workshop held at East Lansing, Michigan in September, 1955. This 189 page report was placed in the mails the second week of December and should be in your hands as this is written, barring delay due to the Christmas rush.

We regret it has taken so long to get this report into print. The task of transcribing the talks from the tapes and the necessity for a great deal of editing required far more time than anticipated. By the time the report was ready for the printer, we bumped into a backlog of text book printing. Late as it is, we hope you'll find it helpful and worth while.

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With the collaboration of Dick Lawson of the WILL-TV staff we have also published the first of what we hope will be a series of Staging, Lighting and Grapic Arts Newsletters. These have been sent to those who attended the NAEB Staging and Lighting Workshop at Ann Arbor last August, and to managers and directors of all ETV stations and production centers. We know our list of staging, lighting and graphic arts personnel is far from complete. We hope to reach everyone concerned, so if we missed you please write and ask to be added to our mailing list.

Included in the mailing to managers is an SMPTE paper "An Inquiry Into Standards for Television Slide Production" and "Preliminary Specifications for the Ampex VR-1000 Videotape Recorder/Reproducer." We'll be glad to supply these upon request.

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CBS-TV has placed its two prototype models of the Ampex Videotape Recorder into daily use for West Coast repeats of the Douglas Edwards News program. Picture quality is reported far superior to kinescope quality and compares with the best 35mm film with superior contrast range.

Observers report occasional appearance of fine white lines in the picture attributed to "tape drop out." This is caused by the texture of the magnetic material on the base. It is accentuated when the magnetic oxides are not evenly flowed onto the plastic base. Tape suppliers have been giving special attention to this problem, with pre-testing of each reel of tape slated as one possible method of whipping this problem.

NBC-TV in Hollywood has received the first of its Ampex Videotape Recorders; but until tests have been completed no plans have been made for "on the air" use. Delivery of the second recorder is expected soon with a third to go to New York Network facilities. We regret we can't give a first hand report of the use of videotape on the air. We'd appreciate hearing from our West Coast readers with their comments on reception.

The way we figure, it may be a long time before we "corn pickin" middle westerners see programs on videotape. If possible, Ampex officials have promised to advise in advance of coast-to-coast broadcasts on tape.

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An interesting application of the use of infra-red reflecting glass is outlined in a story on page 89 of the December 10 *Broadcasting-Telecasting*. This glass reflects radiant heat but transmits more than 75% visible light. Rectangles of glass, 12 x 16 inches, were installed on frames in front of the spotlights used. The glass was held at an angle of approximately 45 degrees to reflect heat towards the ceiling and away from the light fixture itself.

This method was used for WSM-TV telecasts from Ryman Auditorium in Nashville (which is not air conditioned). WSM officials believe at least 50% of the heat from the spotlights was dispersed, which made it possible to televise "Grand Ole Opry" throughout the summer. They were so impressed they plan to install heat reflecting glass in the regular

WSM-TV studio which is air conditioned). In addition to cutting down heat, they also believe a reduction in the amount of infra-red light improves picture quality.

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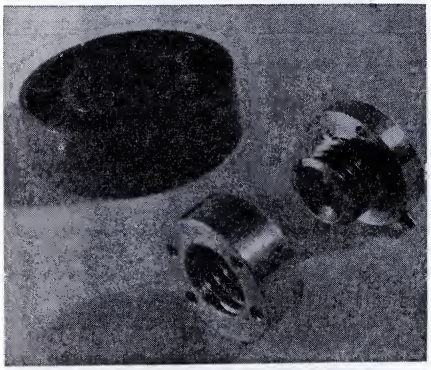
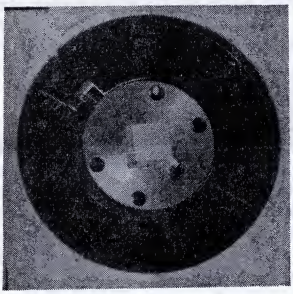
On our visit to KCTS in Seattle, we picked up an idea which may be helpful. In order to cut down on their inventory of 16mm reels, they use a split reel in conjunction with a plastic core and a brass hub which they designed and built. This way they are able to store film in cans on the plastic core (used for bulk film) and operate with a small number of split reels. The illustrations show the parts of the brass hub separated and with the hub in the plastic core.





KCTS is fortunate in being able to have the hubs made at a trade school at no other cost than the 1 inch brass stock. They also buy the inexpensive reels, take them apart and install the brass hubs, thus making a very reasonably priced split reel. We don't have a working drawing for the hub, but believe you all have the important dimensions available to have these made, if you wish to adopt this practice.

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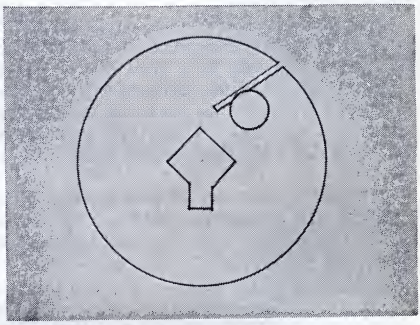
We also picked up a tip from Ross Scroggs at WUNC-TV which has a more limited appeal since it is for use with a film processor.

WUNC-TV has been making kinescope recordings of the University of North Carolina football games. They built a film magazine which holds an hour's film so it is possible to reload the magazine in the 20 minutes between the halves of the game. The kine is then edited and shown on WUNC-TV on Sunday evening.

WUNC-TV does its own film processing. Ross has a special metal core he uses to make sure he does not pull the film leader through his film processor, and avoids the necessity for rethreading the processor. He uses a metal core as the take up hub in the kinescope recorder magazine. Sufficient leader for the processor is attached at the start of each hour's unexposed film. The special core contains a slot just wide enough to accomodate the thickness of the film. In threading the magazine, the end of the leader is folded over so the leader won't pull out of the core.



The film is processed backwards, that is, from end to beginning. When the exposed film has run through the processor and pulled the leader through to the end, the tension stops the processor, threaded with leader.

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We have just received the 25th Anniversary Issue of *Broadcast News*, a publication of the Radio Corporation of America. Among other articles it contains a 13 page, well-illustrated description of KETC, The St. Louis Educational Television Commission station. There is also a short story devoted to WHYY-TV of the Metropolitan Philadelphia Radio and Television Corporation.

TV TECHNICAL TIPS NO. 29

The revised NAEB Technical Directory is ready to go press. The new edition will contain the names of over 400 engineers and technicians working at educational radio or TV stations and production centers. This is over a 100 per cent increase in the listings of the original directory published in May, 1955; yet it still is not complete.

We want to thank those of you have returned the directory questionnaires and test equipment data. We believe we have included the names of all who sent this information.

We have also sent a second inquiry to some 20 stations, some of whom have not yet returned the information (although each form was accompanied by a stamped return envelope). Our crystal ball is somewhat cloudy, so if the technical personnel at your station is not included it isn't because we haven't tried.

We'd like to keep this directory up-to-date, and would appreciate having the names of those added to your technical staff. If someone leaves, too, we'd like a post card or short note asking us to delete his name. It would also help if you would advise us of errors in addressograph plates or in the station address and telephone number.

Data secured as a result of the test equipment questionnaire is being compiled. We hope to publish this material soon and circulate it to all chief engineers.

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Another publication of the NAEB Engineering Service is an article which contains the constructional details of a two-channel transistor remote amplifier-mixer. This was designed and built by Donald K. Haahr of the WOI staff. The completed amplifier is 3 inches high, 6 inches wide and approximately 8 inches long. It has an overall gain of 80 DB into a 600 ohm load and excellent frequency response.

The article is complete with schematic, parts list, frequency response, noise and distortion characteristics, as well as three illustrations which show important constructional details and the completed unit.

Copies of this paper have been mailed to all chief engineers of educational radio and TV stations. We shall be glad to take care of individual requests as long as the supply lasts.

* * *

For those of you who are thinking of new studio facilities, we'd suggest reading an article which appeared in the January 7 *Broadcasting-Telecasting*. It appears on Page 70, and tells how WSVA-TV built a studio-office building with 2240 square feet of space for $25,000. The studio itself is 28 x 32 feet with a 7 x 13 foot control room and a 7 x 9½ foot projection room. The building also provides space for film preview, an art room, darkroom, combination dressing and rest rooms, a program director's office and a 280 square foot general office.

The building is constructed of Armco galvanized steel. It is fully insulated and temperature is maintained between 70 and 73 degrees throughout the year by a Westinghouse heat pump system. These pumps draw heat from the outside air even in winter and provide cool air in the summer. The two five ton units employed are installed in outdoor metal bins.

The $25,000 is all inclusive and covers studio fixtures, (except TV lighting system) flooring, wiring ducts, toilets, conduits, air pumps and a ball bearing sliding door. At a little over $11 a square foot, this is very reasonable building cost. Construction was begun on July 15 and the first TV program went on the air from the studio on December 15.

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Those of you who watched the inauguration January 21st were privileged to see some of the first network use of Ampex videotape recording for delayed broadcast. Both CBS and NBC taped the oath taking ceremony. CBS replayed it twice at approximately 30 minute intervals after the actual ceremony. NBC also reported that it played back a tape of the ceremony less than a half hour after it had occurred.

The use of magnetic video tape recordings is gradually increasing on the networks. December 24 CBS began using videotape for the West Coast repeats of the Arthur Godfrey "Talent Scouts" program on Mondays at 8:30 p. m. EST. Beginning in March when Godfrey is on vacation, the program will be pre recorded and played back for both East and West Coast broadcasts.

NBC is now making use of videotape for West Coast repeats of five Monday-Friday program series. Beginning January 22, NBC will present the "Truth or Consequences" program (11:30 a. m. - 12 noon EST) on tape. The program will be recorded at a 6 p.m. PST, audience performance and repeated on tape the following day in both East and West.

Ampex officials have also announced they are incorporating six new features in the production models of the videotape recorders as a result of the experience gained by CBS and NBC in their use of the pro totype models. Delivery on the production models is now set for November, 1957, nine months later than the anticipated start of delivery at the time of the initial demonstration of the machine last April.

These new features are: adequate cueing facilities, convenient switching devices, ready synchronization with other studio apparatus, tape interchangeability among recorders, ease in making duplicate copies of taped programs and easy editing.

While all of the above features are of interest to ETV engineers, this is the first mention that Ampex has made of "duplication" of videotape recordings. Officials of the Ampex Corporation have been very conservative in their statements regarding their videotape recorder. They now forsee three steps in the evolution of monochrome videotape: 1) Strictly for delayed broadcast, 2) Prerecording of TV shows, 3) Syndication and multiple release of taped programs for TV.

TV TECHNICAL TIPS NO. 30

In the February *Newsletter* we led off this column with a story about the revised NAEB Technical Directory. If you anticipated receiving a copy of the Directory before this, it isn't lost in the mails.

As I write this, stencils are being cut, and we have a promise that it will be in the mail the first week in March. The Test Equipment Inventory has been completed; the stencils cut, and it, too, should be mimeographed and in the mail that week.

The Technical Directory will go to the complete Engineering mailing list; the Test Equipment Inventory will be sent only to chief engineers.

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We've had a note from John Brugger, chief engineer for the closed circuit TV experiment conducted by the Board of Education of Washington County at Hagerstown, Md., in conjunction with the Radio-Electronics TV Manufacturers Association and the Fund for the Advancement of Education.

He states that during the summer months from June to September they will be expanding their technical facilities. He will need extra technical help for these months and will be happy to employ at least three and possibly six persons to help with this work.

If any of our readers are available for the summer and are interested, you can write direct to John in care of the Board of Education at Hagerstown, Md.

* * * *

Here's a tip from Robert F. Lewis, chief engineer of WFBE (FM) Flint, Michigan, which may foster better engineering-production relationships.

Due to the difficulty in cueing microgroove records and their susceptibility to damage, WFBE (FM) does not use them directly for program production work, such as in themes, bridges, etc. Instead the music for each production is tape recorded in proper sequence in advance. The *tape* is then used during the production.

This method cuts down the error potential to practically zero, plus reducing wear and tear on discs. For playback a fast-starting tape unit, such as the Magnecorder PT6 series, works very well.

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Fifty thousand engineers are expected to attend the 1957 Convention of the Institute of Radio Engineers and the Radio Engineering Show in New York City at the Coliseum and Waldorf Astoria, March 18-21. The program includes 275 papers reporting new developments with 840 exhibits of new apparatus covering all four floors of the Coliseum.

We hope to meet some NAEB engineers there and will be checking the bulletin board near the registration desk to find out how we can get together.

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Another date to remember is the NARTB Engineering Conference and broadcast equipment display at the Conrad Hilton in Chicago April 8-11.

The past two years through the cooperation of NARTB we have provided educational station engineers who wished to attend with NAEB identification cards. This card entitled them to register for the Engineering Conference sessions only, and also permitted entrance to the equipment exhibits by payment of a daily or reduced registration fee for the entire meeting.

We hope this privilege will be extended for the April meeting. A further notice will be forthcoming when definite approval of this procedure has been obtained.

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We have occasional inquiries about the availability of used equipment member stations may have and are not using. This is especially true of used frequency modulation transmitters. The most recent inquiry asked where a used 10 watt FM transmitter might be obtained.

We realize many tax supported stations find it very difficult to dispose of unwanted equipment. But if any of our readers have serviceable equipment which might enable an institution to get on the air, we'd be glad to help buyer and seller get together.

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ATTENTION GAIN GRINDERS!

Electronic fuel injection for automobiles will mean the end of mechanical linkages for accelerator control (no carburetor). Instead, a potentiometer will accomplish the function of present day accelerators. Wonder if they'll ever rate automobiles in dbh (db above one horsepower).

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IRE *Transactions* for February, 1957 contains a paper by Duane Weise, chief engineer of WTTW, presented at the Sixth Annual Fall Symposium of the IRE Professional Group on Broadcast Transmission Systems. It describes the WTTW studio facilities in some detail and contains other practical papers of interest to TV engineers.

Keith Ketcham, chief engineer of WOI-TV, has prepared a resume of a paper by E. D. Goodale of NBC on "Phase, Amplitude and Aperture Correction in TV systems." We have reproduced this resume and sent it to chief engineers of ETV stations and production centers. Additional copies are available upon request to NAEB.

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A nice-looking reprint of the KETC St. Louis article in *Broadcast News* (January *Newsletter,* page 8) is available from RCA, Commercial Electronic Products, Camden 2, New Jersey. The title of this slick publication is "TV and the Crisis in Education," and it contains some excellent photos of KETC facilities and personnel.

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A gift of broadcast equipment valued at more than $43,000 was made by Storer-owned WJBK-TV, Detroit, to the local educational WTVS. Equipment includes film chains, control panel, power supplies, monitors, amplifiers and relays.

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We hope more of you will follow Howard Andreasen's example and drop us a note telling of your plans. The Independent School District of Des Moines was granted a CP for Channel 11 on December 12, 1956. They plan to operate at their present KDPS studio until their new TV studio is finished in late summer of 1958.

Present plans call for regular programming to begin in late September, 1957, with 10 kw ERP. Power will be increased to 50 kw when the new transmitter site is completed.

NOW WE'RE IN PRINT

—BY MRS. JUDITH STEVENS, EDITOR

The radical face-lifting given the cosy old NAEB *Newsletter* stems from the many more copies now being distributed. Since the AERT-NAEB merger is officially consummated this month, the *Newsletter* goes to 1500 persons and/or institutions. Printing is less expensive than mimeographing when working with this quanity, and here we are.

Many differences are at once apparent. By setting our news in type, we use about one-fourth as much space as we did before, so the new *Newsletter* is quite thin. It'll be much easier to keep copies, as loose leaf notebooks can accommodate far more issues now.

Now that we're in print, photographs can be easily incorporated in our news. So when you send us news releases, send pictures, too. Make sure the photos are clear, not fuzzy, and preferably of persons doing something, not just staring at the camera.

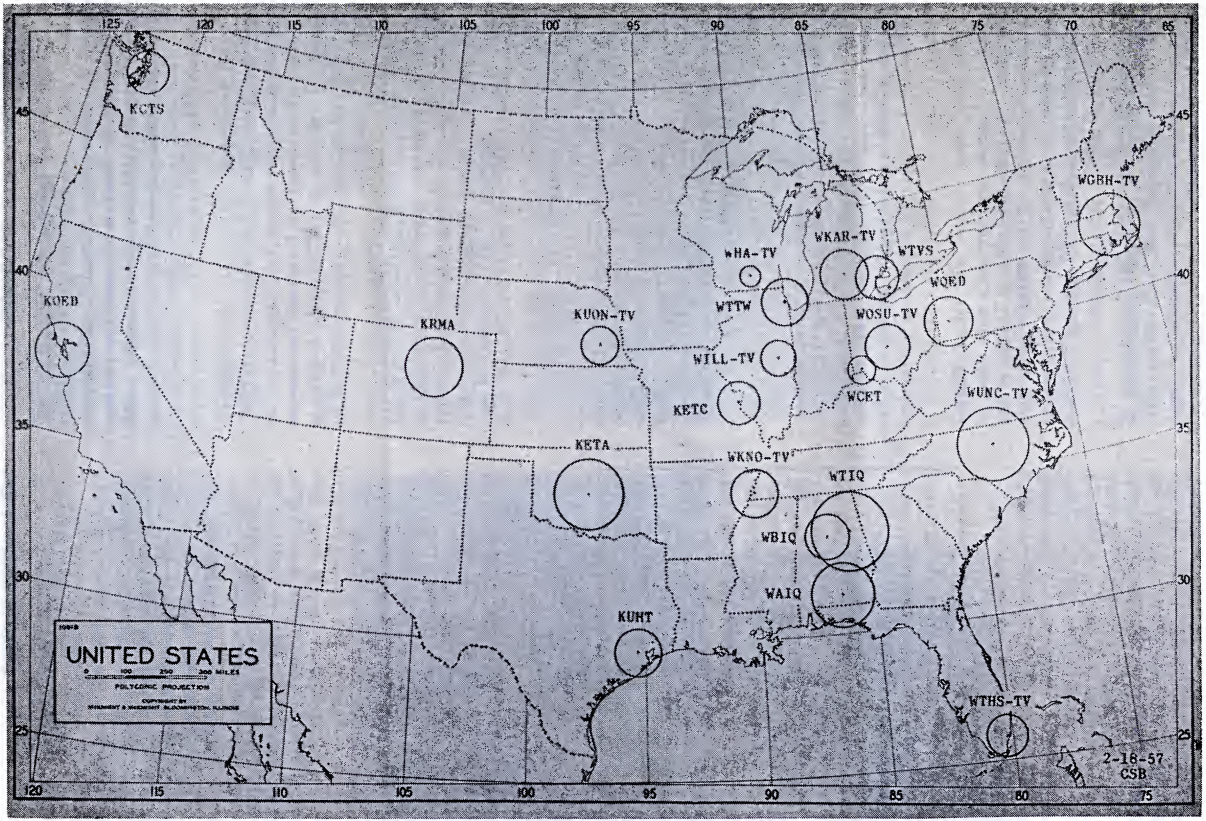
We feel the *Newsletter's* "new look" is becoming. Hope you agree.

BOX SCORE

You probably notice the figures this month have changed considerably, some up and some down. For months we have been plagued with the fact that everyone prints or quotes different figures on the number of TV, AM and FM stations. No one knew who was right, so we wrote FCC. The figures this month are the ones the FCC sent us. From now in we're using these, which, incidentally, are the same as the ones the NARTB uses.

Total TV stations — 511 (includes 22 non-commercial)
Total AM stations — 2987 (includes 37 non-commercial)
Total FM stations — 654 (includes 126 non-commercial)

Since we needed copy to fill out this page, we lifted two items above from the January *Newsletter.* We haven't changed editors, Judy does the general *Newsletter* and I paste up her work every three months. We too, feel that printing is a big improvement. The engineering mailing list now has over 400 names so we save too on postage. Now that we can use pictures and photographic reproductions of schematics or line drawings, we echo her words "send them along." CSB



Grade B service contours for non-commercial ETV stations now on the air, based on new propagation and receiver data in FCC Docket No. 11532 using present ERP and antenna heights. Circles show minimum local field intensities as follows: VHF Chan 2-6 53 dbu; VHF Chan 7-13 44 dbu; UHF Chan 14-83 35 dbu.

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